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10/512,407	10/25/2004	Masahiro Oshikiri	L9289.04162	4624

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EXAMINER	
SHAH, PARAS D	

ART UNIT	PAPER NUMBER
2626	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/512,407	OSHIKIRI, MASAHIRO	
	Examiner	Art Unit	
	PARAS SHAH	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 March 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *43-56* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *43-56* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

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DETAILED ACTION

1. This communication is in response to the Amendments and Arguments filed on 03/17/2009. Claims 43-56 are pending. The Applicants' amendment and remarks have been carefully considered, but they do not place the claims in condition for allowance.

2. All previous objections and rejections directed to the Applicant's disclosure and claims not discussed in this Office Action have been withdrawn by the Examiner.

Response to Arguments

3. Applicant's arguments (pages 8-11) filed on 03/17/2009 with regard to claims 43-56 have been fully considered but they are moot in view of new grounds for rejection. Please see 112 1st and 2nd paragraph rejection explained below.

Response to Amendment

4. Applicants' amendments filed on 03/17/2009 have been fully considered. The newly amended limitations in 43-56 necessitate new grounds of rejection. Specifically the limitations of "generates an error spectrum by flattening and attenuating, the decoded spectrum using an exponential function whose exponent is a predefined constant and a multiplication with a predefined constant, compares the estimated error spectrum with the auditor masking threshold" necessitates new grounds for rejection.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 43, 48, 53, 54 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: the defining of the base for the exponent. The claim recites that the decoded spectrum is attenuated using an exponential function but the base of the exponential function is not defined in the claims in order to determine what the exponential function is and how the attenuation is occurring on the decoded spectrum.

7. Claims 55 and 56 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: the defining of the base for the exponent. The claim recites that the decoded spectrum is attenuated using an exponential function but the base of the exponential function is not defined in the claims in order to determine what the exponential function is and how the attenuation is occurring on the decoded spectrum.

8. Claims 43, 48, and 53-56 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear from the wording of the claim as to what the exponential function represents (an e^x or another function raised to a power (f^x)). Further, it is unclear as to the wording of "using an exponential function whose exponent is a predefined constant and a multiplication with a predefined constant." It is not clear as to whether the second constant is intended to be the same

and whether this second constant is multiplied with the exponent or multiplied by the exponential function. For the purposes of compact prosecution, the limitation that has been amended has been interpreted to mean an exponential function, being an error spectrum, raised to some power (any value) and the error spectrum being multiplied by any constant (including 1). It is suggested by the Examiner that the equation that is being claimed in the claims be fully described to overcome the 112, 2nd or to place the actual formula within the claims in order to over come the rejection, mentioned above.

Claim Rejections - 35 USC § 101

9. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

10. Claims 43-54 are rejected under 35 U.S.C. 101 because the claims appear to be directed to a software embodiment and not to a hardware embodiment, where a machine claim is directed towards a system, apparatus, or arrangement. The claim limitations, which are means plus function, appear to be directed towards a program as stated in the published application, paragraphs [0395]-[0397], where the signal processing method is contained in the form of a program. Since, all of the claimed limitations (signal processing method referred to the claimed functions performed by the structures in the claim) are contained in the form of program stored in RAM or ROM, the claim is directed to software and not hardware since no storage of these instructions in a computer memory executed by a processor is being described. Further, the claim does not contain any limitation that would enable the claim not to be directed towards

software. Thus, the claims are directed towards non-statutory subject matter. See MPEP 2106.01 [R-5]. Data structures not claimed as embodied in computer readable media are descriptive material *per se* and are not statutory because they are not capable of causing functional change in the computer. See e.g., Warmerdam, 33 F.3d at 1361, 31, USPQ2d at 1760 (claim to a data structure *per se* held nonstatutory). Such claimed data structures do not define any structural and functional interrelationships between data and other claimed aspects of the invention, which permit the data structure's functionality to be realized. In contrast, a claimed computer readable storage medium encoded with a data structure defines structural and functional interrelationships between the data structure and the computer software and hardware components which permit the data structure's functionality to be realized, and is thus statutory.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 43-45, 48, 49, 55, and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jin *et al.*(JP 08-263096) in view of Pan *et al.* (US 6,092,041)

As to claims 43 and 55, Jin et al. teaches a sound coding apparatus comprising:

a first coding section (see [0015], 1st encoder 241) that performs weighting on an input signal to mask a spectrum of quantization distortion by a spectral envelope of the input signal, and thereafter encodes the input signal and obtains first coding information (see [0020], acoustic sense weighting filter 42 is used for performing weighting in order to consider the masking property of humans. The acoustic weighting determined based on spectral weighting);

a decoding section (see [0015], local decoder 251) that decodes the first coding information and obtains a decoded signal (see [0015])(e.g. The local decoder decodes the signal from the encoder 241.);

a subtracting section (see [0015], difference circuit 28) that obtains a residual error signal of the input signal and the decoded signal; and

a second coding section (see [0015], 2nd encoder 242) that encodes the frequency region in the residual error signal specified by the specifying section, and obtains second coding information (see [0015], difference circuit 28) between said input signal and said decoded signal of which sampling rate is raised, and obtains second coding information (see [0015] and [0016]) (e.g. The values of the decoded signal for which the sampling rate was raised and the input signal are the parameters. A difference is computed and the second coding information is obtained.).

However, Jin *et al.* does not specifically teach the specifying section that calculates an auditory masking threshold for a decoded spectrum that is obtained from the decoded signal, generates an error spectrum by flattening and

attenuating, the decoded spectrum using an exponential function whose exponent is a predefined constant and a multiplication with a predefined constant, compares the estimated error spectrum with the auditor masking threshold, and specifies a frequency region in the error spectrum showing an amplitude equal to or greater than the auditory masking threshold;

Pan does teach the a specifying section (see Figure 1, Hybrid Psychoacoustic Modeling and Quantizer Control Unit 132) that calculates an auditory masking threshold for a decoded spectrum that is obtained from the decoded signal (see Figure 1, output of low bit rate decoding unit 130, into 132), generates an error spectrum (see output of 110, into Time-Frequency analysis unit 114) by flattening and attenuating, the decoded spectrum using an exponential function whose exponent is a predefined constant and a multiplication with a predefined constant (see Figure 1, output of 110, where the subtracted input and decoded signal is the attenuated estimated error spectrum and the predefined constants were interpreted to be 1, which yields the error signal in the frequency domain), compares the estimated error spectrum with the auditory masking threshold (see col. 6, lines 6-12, frequency coefficients are used indicating a spectrum of the signal and compared to masking thresholds), and specifies a frequency region in the estimated error spectrum showing an amplitude equal to or greater than the auditory masking threshold (see col. 6, lines 6-12, frequency coefficients are flagged for those that may be omitted from coding and see Figure 4).

It would have been obvious to one of ordinary skilled in the art at the time the invention was made to have modified the sound coding apparatus and method as taught by Jin *et al.* with the inclusion of a specifying section incorporating auditory masking as taught by Pan *et al.* for the purpose of preventing audible distortion and improving coding efficiency (see Pan *et al.* col. 4, lines 44-55).

As to claim 44, Jin et al. in view of Pan *et al.* teaches all of the limitations as in claim 1, above.

Furthermore, Jin teaches wherein:

with respect to the input signal, the first coding section encodes a low frequency region (see [0015], down-sampling from sample rate converter 221 and is input into encoder 241); and

with respect to the residual signal, the second coding section encodes the and encodes a predetermined region in a high frequency region (see [0015], up-sampling from sample rate converter 261 into 2nd encoder 242) (e.g. The sampling frequency is up-sampled on the decoded signal. The sampling frequency of the input and the up-sampler are the same at 24kHz.);.

Furthermore, Pan *et al.* teaches a low frequency region specified by the specifying section (see col. 6, lines 5-15 and col. 4, lines 49-55, lowband frequency coefficients coded for those above a threshold.).

As to claims 45, Jin et al. in view of Pan *et al.* teaches all of the limitations as in claim 1, above.

Furthermore, Pan *et al.* teaches wherein the second coding section finds a difference from the auditory masking threshold value every frequency (see col. 6, lines 5-15 and col. 4, lines 49-55, lowband threshold is compared for all frequency coefficients) and determines a distribution of encoded bits based on the differences (see col. 6, lines 5-15 and col. 4, lines 49-55, those coefficients not above a threshold are not coded.) (e.g. The distribution of encoded bits occurs from the omission of those frequency coefficients not above a threshold at each frequency.)

As to claims 48-50 and 56 are rejected as reciting similar limitations as that cited above for the encoder. It is well known in the art that the decoder is a mirror image of the encoder. Further, the cited reference mentions the use of a decoder with all steps shown in the decoder claims (see [0022]-[0024], decryption and Pan *et al.* Figure 1, decoder portion).

13. Claims 46, 47, 51 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jin *et al.* in view of Pan *et al* as applied in claim 43, above and further in view of Kono (JP 08-046517).

As to claims 46, Jin *et al.* in view of Pan *et al.* teaches all of the limitations as in claim 1, above.

Furthermore, Pan *et al.* teaches a frequency showing an amplitude equal to or greater than the normalized auditory masking threshold (see col. 6, lines 5-15 and col. 4, lines 49-55, those coefficients not above a threshold are not coded and the analysis is done for each frequency.).

However, Jin *et al.* in view of Pan *et al.* do not specifically teach that the normalization of a threshold specifying a frequency region.

Kono does teach a auditory masking being normalized for each specified frequency region (see [0059], the alpha is a level for which a maximum noise allowance is determined for each critical band.)

It would have been obvious to one of ordinary skilled in the art at the time the invention was made to have modified the coding apparatus taught by Jin *et al.* in view of Pan *et al.* with the use of auditory masking normalization for a specific region as taught by Kono. The reason for using the normalized auditory masking threshold for specific frequency regions involve there existing only two finite types of applying thresholds, which consists of applying the threshold at each frequency or at each frequency band, which would have been obvious to one of ordinary skilled in the art to choose from this finite number of options with a reasonable expectation of success (see MPEP 2143, Exemplary Rationales, Rationale E). Further the use of a threshold at a band level enables the threshold criteria to be uniform for similar frequency bands.

As to claims 47, Jin *et al.* in view of Pan *et al.* teaches all of the limitations as in claim 1, above.

Furthermore, Jin *et al.* teaches the encoding being done of the enhancement layer by a rectangular cosine conversion using a discrete cosine transform (see [0021], rectangular cosine transform for encoder 242).

However, Jin *et al.* in view of Pan *et al.* does not specifically teach the encoding being done by orthogonal transformation using MDCT processing.

Kono does teach

said enhancement layer coding section (see [0032], coding network 54 encodes an input signal using orthogonal transformation using MDCT (see [0038] and [0041], MDCT circuit 13).

It would have been obvious to one of ordinary skilled in the art at the time the invention was made to have modified the coding apparatus taught by Jin *et al.* in view of Pan *et al.* with the use of encoding using orthogonal transformation with MDCT processing as taught by Kono. The motivation to have combined the references involves the consideration of the auditory masking from the spectrum of data (see Kono, [0038]). Further, the encoding of the enhancement layer using MDCT is another method for encoding a signal as is well known in the art.

As to claims 51 and 52 are rejected as reciting similar limitations as that cited above for the encoder. It is well known in the art that the decoder is a mirror image of the encoder. Further, the cited reference mentions the use of a decoder with all steps

shown in the decoder claims (see Jin *et al.* [0022]-[0024], decryption and Pan *et al.* Figure 1, decoder portion).

14. Claims 53 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ebara *et al.* (JP 2000-322097) in view of Jin *et al*. in view of Pan *et al.*

As to claim 53, Ebara *et al.* teaches a communication terminal apparatus (see [0045])

However, Ebara *et al.* does not specifically teach the coding apparatus as claimed in claim 1.

Jin *et al.* in view of Pan *et al.* does teach the coding apparatus as claim 48 (see Jin [0015]-[0016] and Pan, col. 6, lines 66-15 and see above rejection for claim 48).

It would have been obvious to one of ordinary skilled in the art at the time the invention was made to have modified the terminal as apparatus taught by Ebara *et al.* with coding apparatus as taught by Jin *et al*. in view of Pan. The motivation to have combined the references involves equipping the sound transmitter with a type of voice coding and decoding equipment quality improvement (see Ebara *et al.,* [0044] and abstract).

As to claim 54, Ebara *et al.* teaches a base station (see [0046])

However, Ebara *et al.* does not specifically teach the coding apparatus as claimed in claim 1.

Jin *et al.* in view of Pan *et al.* does teach the coding apparatus as claim 48 (see Jin [0015]-[0016] and Pan, col. 6, lines 66-15 and see above rejection for claim 48).

It would have been obvious to one of ordinary skilled in the art at the time the invention was made to have modified base station apparatus taught by Ebara *et al.* with coding apparatus as taught by Jin *et al*. in view of Pan. The motivation to have combined the references involves equipping the sound transmitter with a type of voice coding and decoding equipment quality improvement (see Ebara *et al.,* [0044] and abstract).

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kim (US 5,649,053) is cited to disclose encoding audio signals. Gerson et al. (US 5,826,224) is cited to disclose weighting of the error spectrum based on perceptual consideration. Park (US 6,438,525) and Grill et al. (US 6,502,069) is cited to disclose coding of audio signals using a scalable scheme. Gao (US 7,013,268) is cited to disclose weighting filters in a celp encoder.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PARAS SHAH whose telephone number is (571)270-1650. The examiner can normally be reached on MON.-THURS. 7:00a.m.-4:00p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on (571)272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David R Hudspeth/
Supervisory Patent Examiner, Art Unit 2626

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06/01/2009